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**THE INTERMEDIARY'S DILEMMA:
ASSESSING THE FINANCIAL STRENGTH
OF LIFE OFFICES**

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Choice of Quotations:

"Life is the art of drawing sufficient conclusions from insufficient premises".

(S. Butler : Note-Books, 1912)

"Figures won't lie, but liars will figure". (C.H. Grosvenor)

"I hate quotations. Tell me what you know".

(R.W. Emerson : Journals, 1849)

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THE INTERMEDIARY'S DILEMMA : ASSESSING THE FINANCIAL STRENGTH OF LIFE OFFICES

1. Introduction

The intermediary of our title is any individual or institution engaged in providing financial advice to a potential investor. In formulating his advice the intermediary will follow a process of narrowing down the range of choice in a step by step manner. Such a system is essential given the bewildering array of investment institutions and products available in the UK savings market.

1.1 This task is becoming no easier with recent legislation opening up the range of institutions which can offer particular investment vehicles. For example, the Social Security Act 1986 enables banks, building societies and unit trust groups to become involved in the personal pensions market. With the exception of Additional Voluntary Contribution schemes offered by building societies, none of these institutions is likely to have figured on a pensions intermediary's short list of possible havens for investment.

1.2 This paper is not concerned with the intermediary's task of choosing the appropriate investment institution for the particular needs of his client. Rather we start from the point at which a decision has been taken to recommend investment with a life insurance company. Indeed we advance from this stage and assume, not only that the type of contract (annuity, endowment assurance or whatever) has been selected, but that the with-profits as opposed to unit-linked route has been chosen.

1.3 The intermediary is now confronted with a choice between very many life companies. This can be further narrowed down by reference to contract terms, such as surrender values and underwriting standards. The final choice however must refer to the relative value for money offered by the remaining contracts.

1.4 We can identify two stages in this choice. Stage one is a retrospective basis: it is possible to refer to the investment record of each life company (policy proceeds or unit-linked fund performance) and expense ratios (thereby weeding out the less efficient offices), for example. This identifies the companies whose contracts have performed best in the past. Unfortunately, superior past performance in itself does not necessarily give a reliable guide to the future.

1.5 The second stage attempts to form a judgement on the likely relative success of life companies in the future. Traditionally, projections of policy proceeds making certain assumptions on future bonus levels have played a very important role in this assessment. It is possible to sympathise with the assumptions implicit in this method:

- reversionary bonuses have been increasing for very many years - surely it is reasonable to assume continuation of existing rates?
- the security of life offices cannot be in doubt - surely this is unworthy of consideration?
- life companies themselves provide the illustrations - surely this is an endorsement of the illustrations' validity?

1.6 As the events of April 1986 showed (when a large long established mutual life insurance company had to cut its bonus rates and be rescued by one of its competitors), these assumptions cannot be lightly taken. The financial strength of life companies which for so long had been taken for granted (the crashes around 1974 had been long forgotten) suddenly became topical.

1.7 Allied with these events was the growing concern within the life insurance industry on the sustainability of bonus levels under the altered investment conditions then prevailing. A lengthy debate within the industry and the actuarial profession has culminated in a voluntary agreement amongst members of the Association of British Insurers which limits projections of policy proceeds.

1.8 Pity the poor intermediary : not only had the assumptions underlying bonus illustrations been discredited but the industry replaced the system by a method which was specifically designed to limit its use as a means of choice amongst offices.

1.9 Which brings us to "financial strength". Publicity given to this "new" concept for life companies initially was slanted towards solvency - the danger that a life company might go insolvent (which the mutual referred to earlier patently did not do). Gradually this has changed to viewing financial strength as a measure of future bonus earning potential. This is the subject matter of our paper.

1.10 In Section 5, we describe a method for assessing the financial strength of life offices (including mutual companies). We discuss factors to be taken into account, practical difficulties, and calculation bases. The techniques employed are a development of a method of evaluating quoted life companies.

1.11 The end-product should be of interest not only to intermediaries (including building societies), but to life companies themselves. A league table is not intended; rather, a broad division into categories could emerge. A check on the category into which an office falls should be a source of comfort to a client. As for the offices, they could use the assessments to look at their relative position in the market, and to derive some knowledge of their competitors' bonus potential. We also expect that looking at industry trends over the years would produce food for thought.

1.12 The views expressed by the authors in this paper do not necessarily reflect those of their employer.

2. The Dilemma

2.1 Three developments have focussed the attention of insurance intermediaries on the financial strength of life companies:

- The Securities and Investments Board proposals on "best advice" reinforce the duty to consider risk in formulating a recommendation.
- The Association of British Insurers guidelines on policy illustrations have nullified a widely-used means of choice between life offices.
- The difficulties of a long-established mutual life company that culminated in its merger with a larger office in April 1986 were a major source of embarrassment to those intermediaries who had been placing business there.

2.2 Best advice depends on three criteria:-

- The service provided by each company, both to the intermediary and his client (e.g. speed and accuracy of quotations).
- The value-for-money of competing products (the competitiveness of premium rates, surrender values, underwriting conditions).
- The financial strength of each company - this indicates the security of a company and also has an impact on the value-for-money analysis when considering the bonus potential of with-profit contracts.

2.3 The duty to provide best advice has always existed but it has never been formalised by specific financial services legislation. The S.I.B. is expected to announce the detailed requirements of "best advice" at around the time this paper is to be first presented. We can only speculate on what the S.I.B. will require, but financial strength seems certain to be a major component in the rules - especially with personal pensions looming on the horizon.

2.4 The intermediary's dilemma is that:

- he has a duty to consider a life office's financial strength in relation to its competitors before recommending it to a client, BUT
- there is no simple and reliable means of performing this duty.

2.5 There are two levels of financial strength:

- Financial strength as a measure of the ability of a life company to meet its contractual liabilities.
- Financial strength as a measure of a life company's future bonus-earning potential.

We are concerned with the second, more stringent, definition of financial strength, although clearly an office which is able to meet the reasonable bonus expectations of its policyholders will not go into liquidation.

2.6 It is important to emphasise that the intermediary is most interested in relative strength and that he has to approach the problem as an external observer. Attention has focussed naturally enough on Schedule 1 of the returns to the Department of Trade and Industry (DTI), but as we discuss below there are inherent difficulties in analysing this data. Recognising this (and led by the companies who use a bonus reserve valuation method) some offices have co-operated with intermediaries to the extent of providing internally calculated free reserves on a less conservative basis. However, this does not necessarily allow an assessment of relative strength, as there is no guarantee that the assumptions adopted by different offices are consistent between companies.

3. The Inadequacies of Published Information

3.1 The intermediary's task is not simplified by the publicly-available information. The report & accounts contain little pertinent information. The DTI returns are more useful and provide details of assets, liabilities and EEC solvency margins in Forms 9 and 14 of Schedule 1 (examples are given in Appendix 1). But can these published figures give a satisfactory means of comparing the relative financial strength of different companies? The answer is "no".

3.2 Firstly, the good news - the DTI returns force companies to value assets on a broadly consistent basis (there may be minor differences but these are unlikely to prove significant). The bad news, however, is that the valuation of the liabilities is unlikely to be consistent, both among different companies and also within the same company for different years.

3.3 To give an example: many life companies transacted a substantially increased level of with-profits endowment assurances in 1983 (the "MIRAS" bonanza). There was a substantial initial new business strain associated with this. As a result, a number of companies adopted a Zillmer adjustment for the first time - this was a weakening in the valuation basis. The net result is that a comparison of the difference between the assets and liabilities, as published in the DTI returns, would not provide a consistent pattern for those companies.

3.4 Similarly, the inconsistencies in the annual published valuations of an individual company were highlighted in 1985 when a leading unit-linked company was floated on the stockmarket. The previous five valuations were recalculated on a consistent basis and away from the data published in the DTI returns in order to give a better indication of that company's underlying progress. The differences between the published and restated figures were significant.

3.5 If the valuation bases of a particular company can be inconsistent from year to year, there can be little prospect of separate companies adopting comparable bases in a particular year, never mind over a period of time. Although there is a very gradual trend towards greater consistency prompted by the regulatory authorities, it is unlikely to be realised fully for a very long time and certainly not voluntarily. The problem of assessing the relative strength of life companies remains. The solution must be to revalue each company's business on assumptions which are standardised as far as possible.

4. Formulating the Problem

4.1 First of all, it must be stated that there is no perfect solution to the problem. We certainly do not propose to find a single figure which ranks life companies in order of financial strength. Rather, we believe that a general picture of each company can be built up by examining a number of measures. It is doubtful whether this will produce a clear-cut ranking of offices; it could, however, allow an intermediary to feel happier when recommending one group of offices rather than another.

4.2 The second proviso is that policy proceeds depend on many factors. A number of these can be assessed, such as the level of reserves currently held by a company and the bonus potential of a company's new business. Equally, there are factors which are very difficult or nigh impossible to predict, such as future investment performance. Finally, there is a considerable degree of subjectivity about bonus distributions, depending on, for example, the appointed actuary's view on equity between different categories and generations of policyholders and on marketing strategies at specific points in time. It is impossible to second guess the distribution policy of the appointed actuary.

4.3 These, then are the provisos. But they do not minimise the importance of an intermediary seeking out a solution to the problem we are considering, namely:

- On the basis of published information, which life companies presently appear in a relatively strong financial position and what implications does this have in terms of the ultimate benefit payouts?

5. Our Suggested Approach

5.1 The starting point to the problem must be a consideration of the reserves held by each life company, as defined and calculated in a consistent manner for each company.

5.2 The measure we concentrate on is the "free reserves" held in the life fund. We define these as the difference between the market value of the assets and the value of the guaranteed liabilities (i.e. including bonuses declared to date but not future bonuses). The basis used to value the liabilities should be a realistic one - this is described later in Section 7.

5.3 Free reserves in isolation are not a great deal of use (unless we are simply interested in solvency) - they must be related to something. A number of ratios appear appropriate.

5.4 The first and most straightforward ratio is that of the free reserves to the market value of the assets. This indicates the proportion of a company's assets which is not required to meet its contractual liabilities. This is useful for examining the solvency of a life company, but less so when considering its bonus potential.

5.5 Of more use is to relate free reserves to the benefits which stand to gain from future distributions of surplus i.e. the value of the liabilities for participating business. Consider two companies with a similar level of free reserves to assets: if one company has a significantly lower proportion of with-profit business, then its participating policyholders, *ceteris paribus*, are in a relatively stronger position than those of the second company. Again, however, this is a crude measure. One problem is that it does not differentiate between the average outstanding term of the with-profit products. Another problem is that the net liabilities for the with-profit business, if valued on a realistic basis and ignoring future bonuses, are likely to be small or even in some cases negative.

5.6 A life office may have relatively large free reserves because it has a relatively high loading for future bonuses included in its premium basis. If this is the case, a significant proportion of free reserves is already earmarked for business on the books.

5.7 An improvement is to compare the cost of one year's bonus - as determined on the standardised valuation basis - with the free reserves. Or better still, to calculate the discounted value of all future bonuses for the in-force business.

5.8 The major problem with this method is to decide what future bonus rates to assume. To assume the maintenance of current rates of reversionary bonus would appear sensible. But should account be taken of special reversionary bonus rates - which are now playing a regular role in the distribution policy of certain offices - or of terminal bonus rates? Given that different offices place a different emphasis of the three types of bonus distribution, it appears very difficult to provide an approach which treats the offices on a consistent basis.

5.9 A crude example to illustrate the potential problem is shown below. Consider offices A and B which are identical in all respects, except that office A decides to set its (simple) reversionary bonus rate at one-half that of office B and compensates by providing higher terminal bonuses. By examining the free reserves after allowing for maintained reversionary bonuses only, office A appears much stronger. This is not the case (or strictly it is only marginally the case) : from the point of view of a new policyholder, there is little to choose between the two offices since both effectively have the same level of reserves which are available to support his policy.

| Office | Assets (1) | Free Reserves (2) | Value of Future Reversionary Bonus (3) | $\frac{(2) - (3)}{(1)}$ |
|--------|---------------|-------------------------|--|-------------------------|
| A | 10,000 | 5,000 | 500 | 0.45 |
| B | 10,000 | 5,000 | 1,000 | 0.40 |

5.10 There appears no practical solution to this problem. A ratio of free reserves, after allowing for future maintained reversionary bonus rates, to assets is useful, but it must be viewed in relation to the overall bonus policy of the company. In fact, the initial work we have carried out on this suggests that the problem may not be significant in practical terms.

5.11 Unfortunately, an analysis of the free reserves held by a company provides only a partial solution. A life company may have built up substantial free reserves, but it does not necessarily follow that this can be reflected in future bonus policy. Consideration also has to be given to the margins implicit in a company's new business.

5.12 There are several approaches to this problem. Two possible routes are to assess:-

- The level of reversionary bonus which could be supported by the latest year's new business in isolation and assuming that a certain rate of return can be earned on new money.
- The rate of return which must be earned on new money in order to allow the last year's new business to support by itself the current rate of reversionary bonus rates.

In both cases, allowance is taken for the non-profit business being written which should (hopefully) be subsidising the with-profit policies.

5.13 The approach we tend to favour is to carry out profit tests (or in reality under present conditions "loss" tests) for each class of contract in the last year's new business, assuming that current reversionary bonus rates are maintained indefinitely and that the office earns a rate of return corresponding to that used in valuing the in-force business (as discussed later, this is the current rate of return on medium to long dated gilts). This gives a measure of the level of support which the latest year's new business provides to the free reserves (or in present conditions withdraws from the reserves).

5.14 For proprietary life companies, allowance must be made for the proportion of surplus attributable to shareholders (typically around 10%). A proportion of the free reserves effectively belong to the shareholders and is not available to support bonus rates. Similarly, in calculating the subsidy required to allow the latest year's new business to maintain current rates of reversionary bonus, account must be taken of the shareholders' share in surplus.

5.15 To summarise this section, we believe that the following tests are useful in building up a picture of the financial strength of a life company:

- A comparison of the free reserves with the market value of assets (5.4).
- A comparison of free reserves with the value of future reversionary bonuses at the present rate on the in-force business (5.7).

- A comparison of free reserves, less the value of future reversionary bonuses on the in-force, with the market value of assets (5.10).
- A comparison of free reserves, less the value of future reversionary bonuses on the in-force, with the support required to allow the latest year's new business pay current rates of reversionary bonus (5.13).

5.16 Practical examples of these for three companies are discussed in Section 9.

6. Other Relevant Factors

We believe that an analysis of the financial strength of a life company should concentrate on methods described in the previous section. There are, however, a number of factors which are also useful: these either provide supplementary information (e.g. on financial guarantees, investment performance) or provide an early indication of trends which are developing which may result in a change in the valuation basis for a particular company (e.g. underwriting standards). Examples are as follows:

6.1 The Trend in New Business - A rapid growth in new business, particularly if concentrated in one or two products, could indicate that the company has reduced (or failed to correct a reduction in) the margins in certain areas of its business.

6.2 The Trend in Expense Ratios - Expense ratios are notoriously difficult to monitor from published information. However, a study of expense levels over a number of years carried out in conjunction with a study of new business levels can indicate whether expense levels are improving or deteriorating for a particular office. This can be incorporated into the valuation basis for that office (see paragraph 7.2.2) when drawing up the expense assumptions.

6.3 Underwriting Standards

6.3.1 The D.T.I. returns offer no guidance at all on underwriting standards. Information on non-medical limits, for example, can be gleaned from the trade press but no objective measure of what constitutes a "standard life" is available. This is a function of the mortality basis adopted in premium rate calculations.

6.3.2 Generally, changes in underwriting standards occur very slowly, helped by the moderating influence of reinsurers. Occasionally, a radically different stance may be adopted, such as at the time of the MIRAS boom. The early emergence of death claims arising from "death bed proposals" could have had a minor impact on free reserves.

6.3.3 Underwriting standards are of wider interest to intermediaries. When placing business for a particular client a knowledge of the underwriting requirements of each office is essential if any adverse medical features are present. Underwriting standards also have consequences for bonus potential, but only to the extent that underwriting experience differs from the premium basis.

6.4 Investments

6.4.1 Just as for underwriting, information on investment strategy is sparse. A split is available between the major categories of investment (fixed interest, equities, property), but not within each one. It is possible to form only a very broad view from the returns on the extent to which assets are matched with liabilities. The case of the mutual life company which ran into trouble last year gives a good illustration. The difficulties arose to a large degree from holdings in unquoted overseas companies. It was not possible to establish this from the returns. True, the assets did not satisfy the admissibility regulations but they could arguably have been included in an assessment of financial strength from the point of view of bonus potential. Such a course could be justified on the grounds that the investments offer sound long term value, and provided short term solvency problems do not arise, credit should be taken for the assets as contributors to future surplus.

6.4.2 Past investment performance can be estimated from the DTI returns. The performance of internal unit-linked funds or unit trusts also gives a rough guide to the investment team's past success. Whether this provides a basis for predicting whether the future performance will be above or below average is debatable - we are rather sceptical.

6.5 Financial Guarantees - There is a huge range of financial guarantees which can have consequences for financial strength - for example, maturity guarantees, guaranteed insurability options, guaranteed annuity rates, guaranteed surrender values. A full discussion of all these is beyond the scope of this paper, we merely discuss two examples:

6.5.1 Variable management charges on unit-linked contracts are a comparatively recent development and offer a valuable protection to the financial well-being of a life company (if not its policyholders). Guaranteed charges have an inherent risk that, if inflation again becomes rampant, an office's ability to transact business could be impaired. On a shorter term view, expenses in excess of premium loadings reduce surplus and free reserves.

6.5.2 An example of an extremely onerous financial guarantee can be taken from the US life market. Traditionally, the market was dominated by non-profit whole of life contracts which carried with them policy loans subject to a guaranteed maximum rate of interest. As interest rates rose during the 1970's in response to accelerating prices the guaranteed rates became attractive and the whole life contracts unattractive. Policyholders thus borrowed against the security of their policies and reinvested the proceeds in higher yielding investments. The old-style contracts were no longer viable and gave rise to a generation of universal life products. This also spawned a wave of mergers in the life industry as the companies which did not adapt could no longer operate competitively.

6.5.3 These examples illustrate the importance of considering financial guarantees in assessing financial strength.

6.6 Transfers from Investment Reserves

Under a net premium valuation and a conventional bonus structure life companies frequently support reversionary bonuses through the valuation basis and terminal bonuses through transfers from investment reserves. However, in recent years, it has become more common for reversionary bonuses, whether normal or special one-off bonuses, to be funded by transfers from investment reserves. It is therefore important to look at trends in these transfers and in the reserves themselves (which form part of free reserves in any case).

7. Assessing Free Reserves

Having discussed in Section 5 the figures we wish to estimate for each company, we now discuss the methodology used and the valuation basis employed.

The methods outlined below are based on the mutualisation price techniques first developed in the late 1960's (described in a paper by Derby and Rice (1)). A brief summary of the technique is attached in Appendix 2.

The organisation with which the present authors are associated has employed this technique during the last fifteen years as a means of evaluating proprietary life companies. While the emphasis is different, the basic concept of identifying free reserves by valuing assets and liabilities on bases which are consistent and realistic is the same.

7.1 Data

According to the Insurance Companies Act 1982, each authorised insurer must prepare and submit accounts and statements as prescribed by regulations (currently Insurance Companies (Accounts and Statements) Regulations 1983). These comprise for long term business Schedules 1, 3 and 4, which must be produced annually, and Schedule 5 which for an established company has to be provided at least every fifth year. The information contained in each schedule is briefly as follows:

| | |
|-------------------|--|
| <u>Schedule 1</u> | E.E.C. solvency margins and a comparison of assets (both at market value and as valued by the actuary) and liabilities. |
| <u>Schedule 3</u> | Revenue information on premiums, claims, investment income, expenses and taxation; business in force; new business; an analysis of types of asset. |
| <u>Schedule 4</u> | The valuation report including contract descriptions and details of the valuation basis. |
| <u>Schedule 5</u> | A detailed grouped listing of contracts in force, categorised as appropriate by age, term, year of maturity, for example. Details of surrender values. |

Schedule 5 forms the basis for our calculations and together with the other schedules it allows a reasonably full picture of the life company's products and portfolios to be formed. It is however necessary to refer to other sources to obtain the data necessary to value a company - trade journals for example are used - as well as direct contact with the company.

7.2 Valuation System

7.2.1 A computerised system is used for conventional business. A data file is created from the latest available listing in Schedule 5. This system is specifically designed to be versatile – the classifications adopted in Schedule 5 vary amongst companies and amongst valuation classes within companies. For example, valuation age could be age nearest, age next, age last, to name the three most straightforward definitions. Contracts with defined maturity dates can be classified according to year of maturity or outstanding term. If necessary, the business in force at the time will be projected to the current year to allow for deaths, surrenders and maturities, and increasing ages, as well as for bonuses declared in the intervening period.

7.2.2 For contracts listed in sufficient detail, an office premium valuation can be made, with the following assumptions:

- mortality: as up-to-date as possible. In theory, it should be appropriate to the company's experience; in practice, we use published mortality tables with adjustments.
- interest: the gross rate is taken as the gross redemption yield on medium-long, medium to high coupon gilts. An allowance is made for tax for the appropriate classes of business according to the individual company's tax position. The valuation of the liabilities is therefore consistent with that of the assets, since these are implicitly valued at the same market rate of interest.
- surrenders: unfortunately, not enough data is available on termination of contracts by duration nor is there a listing of the in-force by duration. Hence no explicit allowance is generally made in the valuation basis, but an estimate is made of the release of reserves on surrender, based on published total surrender values.
- expenses: a realistic estimate of expense levels is made, based on the latest available expense data. These are shown in the Returns, split into initial expenses, initial commission, renewal expenses and renewal commission. The expenses of running off the in-force business are thus estimated and discounted to the valuation date.
- business written since the latest Schedule 5: details of this business is obtained from the new business information in the DTI returns and incorporated into the value of the liabilities.

- a capital gains tax liability is estimated (although this is now often detailed in the DTI returns).

A typical valuation basis is given in Appendix 3.

7.2.3 The value of miscellaneous business i.e. contracts not listed in the Schedule 5 would normally be taken at company's valuation, as the total effect will be small. In addition, adjustments to the value of existing business will be made for contingency reserves which may be released, and for the value of any deferred tax relief on unrelieved expenses.

7.2.4 When estimating the value of future reversionary bonuses, the same valuation basis and method is used. The concept is straightforward, although there are certain practical difficulties to be overcome.

7.3 Unit-linked Business

A different method is adopted for unit-linked business. On the basis of published product details, a cash flow model for each "typical" contract is constructed which allows the stream of surplus arising from that contract to be estimated. By then building up a model of an office's in-force business by product and duration, it is possible to calculate the discounted value of future surplus from this section of the portfolio. This discounted value is then subtracted from the value placed on the linked liabilities in the company's published valuation basis to obtain the value which we place on these liabilities.

7.4 Free Reserves

Free reserves are then estimated as the difference between:

- assets at market value including assets inadmissible under the Insurance Companies Regulations 1981, and
- the present value of likely future contractual benefit outgo less the present value of likely future premium income, under realistic assumptions (discussed in more detail in 7.2.2 and Appendix 3).

In this context, contractual benefits are defined as the guaranteed benefits as at the valuation date. For participating business this is basic sum assured plus reversionary bonuses already added to the contract plus any guaranteed bonus element in the future.

Free reserves on this basis therefore represent a best estimate of the discounted value of future surplus likely to emerge from the fund.

7.5 New Business : Conventional Products

7.5.1 The essence of the method is to perform profit tests on the current range of contracts sold. Based on the latest year's new business a model can be constructed of a typical year's production. The establishment of 'typical' may on occasion require that any fluctuations (such as exceptional MIRAS business in 1983, and the individual pensions boom before the 1985 budget) have to be adjusted for - inevitably a subjective matter. We estimate the profitability of each type of contract by calculating the present value of office premiums, deducting the present value of benefits, and realistic expense estimates. The benefits are taken to include the current rates of reversionary bonus. The premiums here are taken as typical premiums for the contract in question - average premiums and average benefits are available from the new business data in Schedule 4 of the DTI returns. The expense levels are decided upon after considering the number of new policies, new annual and single premiums, and those in force, in relation to total expenses.

7.5.2 The profit figure is then reduced to allow for surrenders, by between 20% and 50%, depending on the type of contract. This adjustment stems from Patrick and Scobbie (2). The profit for the contract can be expressed as a percentage of premium, and applied to the new business premiums to produce the discounted value of surplus of a particular year's business.

7.6 New Business : Unit-linked Products

7.6.1 Again, the cash-flow method is employed which allows the discounted value of surplus arising from a particular contract to be estimated. The value of profits from the last year's linked new business can thus be computed.

7.6.2 Under the current market conditions (i.e. most importantly, assuming an interest rate of around 10½% p.a.), it is normal to find that the with-profit business cannot support by itself current rates of reversionary bonus. The subsidy from the non-profit business helps, but it is still very unusual for a year's new business as a whole to be self-supporting in terms of reversionary bonus rates.

8. Problems

A number of problems are inevitably encountered. We list below the more significant.

8.1. Timing. The DTI returns are normally available only some 6 months after the end of the year to which they relate. Any analysis on that data will inevitably be subject to a delay. However, it is not likely that the financial strength of a company will change so rapidly that the delay is dangerous. Any companies potentially at risk of a deterioration should hopefully have been identified in previous years and a weather eye could have been kept on them.

8.2 Deficiencies in the DTI Returns. The DTI returns clearly do not contain all the data which are ideally required for a valuation of a company's liabilities. In fact, the information which is lacking or not fully available is less significant than may be supposed. The main areas in which more information would be useful (and with which to some extent the quoted companies have been willing to supply us) are:-

- Expenses : a more detailed breakdown of expenses would be useful, preferably split between the life assurance, annuity and pensions business. There is also a problem that reinsurance agreements between subsidiaries or between subsidiaries and the parent company can distort the expense pattern - in certain cases, a company has mentioned in its DTI returns that the split of expenses shown between its subsidiaries and the parent company may not give a completely accurate picture.
- Surrender details by duration would be helpful in performing profit tests - estimates based on industry averages are presently used.
- Group pension business is hard to analyse from DTI information.
- For companies transacting both industrial and ordinary branch business, there is no split of the assets between the two funds in the DTI returns. While this does not pose a problem when looking at the overall strength of the company, it does cause problems when considering the bonus potential of the ordinary branch business (the intermediary obviously has no interest in the industrial branch products). Unless indicated otherwise by the company, it is necessary to make the somewhat heroic assumption that the assets split in the same proportion as the value of the ordinary branch and industrial branch liabilities.

8.3 Subsidiary Life Companies

8.3.1 One theoretical consideration is how to treat the unit-linked or managed fund subsidiaries when these are owned by the policyholders of the main fund (as is always the case for mutual life companies).

8.3.2 In the DTI returns of the parent company, these are valued purely by the size of their capital and reserves. It is tempting also to adopt this approach when assessing the financial strength and bonus potential of the office (in practical terms this is the simplest method). However, we believe that an adjustment should be made to the value shown in the DTI returns to allow for the surplus stored up in the life funds of the subsidiaries:-

- It is only fair to take account of the hidden equity in the subsidiaries.
- More importantly, it places those companies which write unit-linked business through a separate subsidiary on a consistent footing with those which write unit-linked business in the main fund.

9. A Practical Example

We are aiming to design a practical method of assessing the relative financial strength and bonus-paying potential of life companies. It is fitting to conclude this paper with an example. In order to preserve the anonymity of the offices involved, we have adjusted all numbers to correspond with a market value of assets of 100,000 units.

We show below data for three companies. The following comments can be made:-

- Looking at the difference between the value of assets and liabilities in the DTI returns, it appears superficially that office B is the strongest and office C the weakest. There appears a significant difference in the strength of each office.
- However, using our consistent valuation basis the free reserves, as a proportion of assets, of each office are much more closely aligned (albeit the ranking remains the same).
- Although the value of one-year's reversionary bonus (on our valuation basis) is lowest for office C, the value of future reversionary bonuses (at the current rate) is greatest. This reflects the longer average term for its with-profit contracts (office C has more of a bias towards mortgage-related endowments and personal pension products than the other two offices). Allowing for future reversionary bonuses on existing business, therefore, the free reserves of office C are lower than for office A and, particularly, office B.
- On our assumptions, the new business of all three offices requires support from the free reserves in order to maintain current reversionary bonuses. Interestingly, however, the subsidy in each case is not as large as may have been supposed. On this measure (ratio 5 below), office A emerges in a somewhat less favourable light than the other two.
- The overall conclusion would be that office B appears slightly better placed than the other two to maintain current rates of reversionary bonus. But all three offices are in a sound financial position.
- For interest, in the past performance league tables for with-profit contracts, office B is presently showing the highest maturity values of the three offices and office C the lowest.

| | Office A | Office B | Office C |
|---|-------------|-------------|-------------|
| Company's Published Valuation Basis: | | | |
| Market Value of Assets | 100,000 | 100,000 | 100,000 |
| Value of Liabilities | 62,900 | 49,100 | 76,500 |
| Free Reserves | 37,100 | 50,900 | 23,500 |
| Value of One-year's Reversionary Bonus | 3,400 | 3,150 | 3,310 |
| Our Valuation Basis: | | | |
| Market Value of Assets (1) | 100,000 | 100,000 | 100,000 |
| Value of Guaranteed Liabilities | 38,500 | 37,800 | 39,700 |
| Free Reserves (2) | 61,500 | 62,200 | 60,300 |
| Value of One-year's Reversionary Bonus | 2,730 | 2,130 | 1,660 |
| Value of Future Reversionary Bonus (3) | 25,500 | 19,100 | 29,000 |
| Ratio of $\frac{(2) - (3)}{(1)}$ | 36.0% | 43.1% | 31.3% |
| Support Required for Latest Year's New Business (4) | 690 | 236 | 223 |
| Ratio of $\frac{(2) - (3)}{(4)}$ (5) | 52 | 183 | 140 |

Appendix 1. Form 9

Statement of solvency

Name of Company

Global business/UK branch business/Community branch business

Company
registration
number

Global/
UK/CM

Period ended

day month year

Units

For
official
use

Financial year ended 31st December 1985

F9

GL

31

12

19 85

£000

| | As at the end of the financial year 1 | As at the end of the previous year 2 | Source | | |
|--|--|---|--------|------|--------|
| | | | Form | Line | Column |

GENERAL BUSINESS

Available assets

| | | | | |
|---|----|---------|--------|--|
| Other than long term business assets allocated towards general business required minimum margin | 11 | 116,656 | 94,083 | |
|---|----|---------|--------|--|

Required minimum margin

| | | | | |
|--|----|--------|--------|-------|
| Required minimum margin for general business | 12 | 18,686 | 13,653 | 12.49 |
| Excess (deficiency) of available assets over the required minimum margin (11 - 12) | 13 | 97,970 | 80,430 | |
| Implicit items admitted under regulation 10(4) of the Insurance Companies Regulations 1981 | 14 | | | |

LONG TERM BUSINESS

Available assets

| | | | | |
|---|----|-----------|-----------|-------|
| Long term business admissible assets | 21 | 4,276,396 | 3,782,169 | 10.11 |
| Other than long term business assets allocated towards long term business required minimum margin | 22 | - | - | |
| Total mathematical reserves (after distribution of surplus) | 23 | 2,137,040 | 1,939,357 | |
| Other insurance and non-insurance liabilities | 24 | 526,260 | 115,295 | |
| Available assets for long term business required minimum margin (21 + 22 - 23 - 24) | 25 | 1,613,096 | 1,727,517 | |

Implicit items admitted under regulation 10(4) of the Insurance Companies Regulations 1981

| | | | | |
|-----------------|----|--|--|--|
| Future profits | 31 | | | |
| Zillmerising | 32 | | | |
| Hidden reserves | 33 | | | |

| | | | | |
|--|----|-----------|-----------|--|
| Total of available assets and implicit items (25 + 31 + 32 + 33) | 34 | 1,613,096 | 1,727,517 | |
|--|----|-----------|-----------|--|

Required minimum margin

| | | | | |
|---|----|-----------|-----------|-------|
| Required minimum margin for long term business | 41 | 99,876 | 91,527 | 60.13 |
| Explicit required minimum margin (1/6 x 41, or minimum guarantee fund if greater) | 42 | 16,646 | 15,255 | |
| Excess (deficiency) of available assets over explicit required minimum margin (25 - 42) | 43 | 1,596,450 | 1,712,262 | |
| Excess (deficiency) of available assets and implicit items over the required minimum margin (34 - 41) | 44 | 1,513,220 | 1,635,990 | |

Appendix 1. Form 14

Long Term business liabilities and margins

Name of Company

Global business/~~UK branch business~~/~~Community branch business~~

Financial year ended 31 December 1985

| | | Company registration number | Global/ UK/CM | Period ended | | | Units | For official use |
|--|--|-----------------------------------|------------------|---|--|--------|-------|------------------------|
| | | F14 | GL | 31 | 12 | 19 85 | £000 | |
| | | | | As at the end of the financial year 1 | As at the end of the previous year 2 | Source | | |
| | | | | | | Form | Line | Column |
| Ordinary Long Term Business (all funds) | Mathematical reserves as shown in Schedule 4, after distribution of surplus | 11 | 1,102,226 | 985,633 | | | | |
| | Balance of long term business funds | 12 | 8,736 | 8,015 | | | | |
| | Ordinary long term business funds (11 + 12) | 13 | 1,110,962 | 993,648 | 40 | 16 | | |
| | Valuation deficiencies | 14 | - | - | | | | |
| Industrial Assurance Business | Mathematical reserves as shown in Schedule 4, after distribution of surplus | 15 | 1,034,814 | 953,724 | | | | |
| | Balance of long term business funds | 16 | 6,979 | 6,779 | | | | |
| | Industrial long term business funds (15 + 16) | 17 | 1,041,793 | 960,503 | 40 | 16 | | |
| | Valuation deficiencies | 18 | - | - | | | | |
| Other Insurance Liabilities | Claims admitted but not paid | 21 | 8,931 | 7,394 | | | | |
| | Amounts due in respect of direct insurance and facultative reinsurance contracts accepted except amounts which must be included in line 21 | 31 | 3,662 | 3,437 | | | | |
| | Amounts due to ceding insurers and intermediaries under reinsurance treaties accepted except amounts which must be included in line 21 | 32 | - | - | | | | |
| | Amounts due to reinsurers and intermediaries under reinsurance contracts ceded | 33 | - | - | | | | |
| Other Liabilities | Loans secured | 41 | - | - | | | | |
| | Loans unsecured | 42 | - | - | | | | |
| | Taxation | 44 | 499,342 | 86,701 | | | | |
| | Other creditors | 47 | 14,325 | 17,763 | | | | |
| Excess of the value of admissible assets representing the long term business funds over the amount of those funds | | 51 | 1,597,381 | 1,712,723 | | | | |
| Total (13 + 14 + 17 to 51) | | 59 | 4,276,396 | 3,782,169 | | | | |
| Amount included in line 59 attributable to liabilities to related companies, other than those under contracts of insurance or reinsurance | | 61 | 267 | 8 | | | | |
| Amount included in line 59 attributable to liabilities in respect of property linked benefits | | 62 | 1,530 | 1,468 | | | | |

Line 44 includes £103,609,000 (1984 £81,222,000) tax on exchange adjustments and, where released to revenue, on future redemption profits less losses and on unrealised appreciation of investments (other than those held for linked-life business). For 1985 this line also includes the balance of the estimated liability of the Company to tax on gains less losses if all of the admissible assets were realised amounting to £390,000,000.

Appendix 2. The Mutualisation Price Technique

Stockmarket evaluation of shares has traditionally centred on three criteria: dividends, earnings and net asset values. The first two are most widely used, with the net asset value used only in certain areas of the equity market, notably investment trusts and property shares. Life assurance company accounting lends itself only to the first approach. A comparable figure to the earnings reported by most industrial and commercial companies - fairly reflecting the year's trading outcome - is not available, and there is no attempt in the accounts to provide an asset assessment of the enterprise.

From a fundamental point of view, we believe that it is not feasible to derive earnings comparable with other sectors, but that a meaningful attempt can be made to establish a 'net asset value' for the business.

For a life company the net asset value comprises three elements:-

- The shareholders' capital, reserves and P & L balance.
- The shareholders' equity in the reserves held in the life funds.
- The shareholders' equity in the profits expected to arise from future new business.

The first factor is straightforward and is readily obtainable from the published accounts.

The second factor forms the largest part of a company's mutualisation price. The main funds of a traditional life fund contain substantial reserves. These have been built up partly as a measure of conservatism, but mainly because of the necessity under the reversionary bonus system to defer the emergence of surplus until the later years of contract. Reserves are held on both sides of the valuation balance sheet:-

- On the asset side, investments are included in the company's valuation at less than market value (book value is often used).
- On the liability side, a life company uses very conservative assumptions when valuing its book of business (typically, it may assume that it will earn only 5% p.a. gross on its investments, and liabilities are discounted at that rate).

By valuing the liabilities of each company on a realistic and consistent basis and then comparing the result with the market value of the investments, we can estimate the size of each company's reserves. These reserves can then be allocated between policyholders and shareholders using the appropriate participation rate.

The third factor is a goodwill item, but is important. It places a value on a company's branch structure, its sales force (if any) and reflects the fact that a significant proportion of new business arises from existing policyholders.

Appendix 3. Typical Assumptions

At present, the following are typical assumptions for valuing the UK business of UK life companies:

| | | |
|---|--|--|
| Interest: | Life Assurance Fund : | 8% net |
| | Pension Business Fund : | 10.5% gross |
| | General Annuity Fund : | 10.5% gross |
| Mortality: | Assurances : | A1967-70 ult less 2 years |
| | Annuities in payment : | a(90) |
| | Annuities and Pensions in deferment : | A1967-70 ult less 2 years, or ignored for some contracts. |
| | Pensions in payment : | PA(90) |
| Surrenders and Lapses : The profitability of conventional assurance contracts reduced by 50%. The profitability of conventional individual pensions business reduced by 20%. For unit-linked business, the lapse rates are incorporated in the cash-flow model. | | |
| Discount Rate : 10.5% p.a. compound. | | |

References

1. Derby, P.J. and Rice, P.A. "Evaluation of Proprietary Life Assurance Shares". Presented to FASS on 31/10/1977.
2. Patrick, F.D. and Scobbie, A. "Some Aspects of Withdrawals in Ordinary Life Business". TFA 31 (1969), 53-119.